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**THE OA-10: HOW CAN WE BEST EMPLOY  
IT IN THE AIRLAND BATTLE?**

**A Monograph**

**by**

**Major Mark H. Skattum  
United States Air Force**



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**December, 1988**

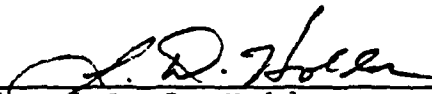
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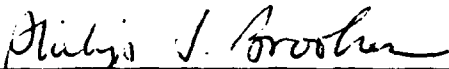
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## ABSTRACT

**THE OA-10: HOW CAN WE BEST EMPLOY IT IN THE AIRLAND BATTLE?**  
by Major Mark H. Skattum, USAF, 45 pages

This monograph addresses how to employ the OA-10 aircraft in the forward air control role in the AirLand Battle. The paper defines forward air controlling and close air support, reviews the history of the airborne forward air controller since World War I, and examines the environment faced by an airborne forward air controller in Europe. The capability of the OA-10 to perform this mission and the employment options under consideration are also examined, testing these options against the Army's requirements for close air support.)

The monograph concludes the OA-10 can perform the airborne forward air control mission, but the role of the airborne forward air controller must be expanded to take advantage of the OA-10's unique capabilities. Neither of the two options under consideration by the United States Air Force does this. Therefore, the Air Force should expand its doctrine concerning forward air controlling if it is going to use the OA-10 as an airborne forward air control aircraft effectively.

*Keywords: High Altitude Air Support, A-10 aircraft, etc.*



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## SECTION ONE

### INTRODUCTION

The United States Air Force (USAF) is currently transitioning A-10 close air support (CAS) aircraft to the airborne forward air control (FAC) mission. In doing this, two questions are emerging on the proper application of the newly designated OA-10: should it be employed in the traditional FAC role, or should the role of the FAC be expanded to incorporate the capabilities of the A-10? The answers to these questions will impact on the effectiveness of future CAS.

This monograph will suggest the answers to these questions, and will cover the following areas: a historical review of the airborne FAC concept, encompassing World War II, Korea, and Vietnam; an analysis of the high-threat air defense system facing CAS and FAC aircraft in Europe; the ability of the A-10 to perform and survive in the OA-10 role; and an analysis of the current employment options

under consideration. The conclusion will determine which of these methods of employment best supports AirLand Battle.

Before dealing with the historical review of the airborne FAC, there are definitions, criteria, and assumptions to establish. It is necessary to first define the doctrine involved for both CAS and FAC missions, since the research question deals with a CAS aircraft being employed in the airborne FAC role. The monograph will examine the feasibility of this transition.

The Air Force defines close air support as "air action against ground targets in close proximity to friendly forces." (1) It is further defined as air action requested by the ground commander against hostile ground targets requiring detailed integration of each mission with the fire and movement of the supported ground forces. (2) Close air support is a subset of the other Air Force missions since air superiority and air interdiction impact on the air threat and ground targets in the CAS arena. (3)

It is this detailed integration between ground and air that requires the FAC. The primary FAC mission is control of CAS sorties and the integration of tactical air support with the fire and maneuver



of the supported ground forces.(4) This mission is done by both ground and airborne FAC's. Ancillary missions of the airborne FAC include visual reconnaissance, convoy escort, air-ground adjustment of artillery, anti-mortar surveillance, air strike coordination, air-ground communications relay, and battle damage assessment.(5)

These missions require a dedicated FAC force and an airborne FAC aircraft that is survivable, maneuverable, and equipped with the communications equipment to coordinate the air and ground effort.(6) Without survivability, the airborne FAC can't get close enough to the battle area to do his job. Maneuverability equates to survivability; the FAC must be able to see the battle while staying away from the air defense threat. If the FAC can't communicate, he can't do his job.

CAS requirements are based on both Army and Air Force needs. CAS must be flexible, available, and survivable to meet Army requirements.(7) The Air Force requires a CAS aircraft with a speed range of 350 to 400 knots, short field takeoff and landing capability, one to two hours loiter time, a 30 or 40mm cannon, jam resistant radios, survivability against short range air defenses, and avionics and munitions for precise attack.(8) General Robert D. Russ, Commander of Tactical Air Command, has also listed five factors he

feels important for the next CAS aircraft: speed, maneuverability, electronic countermeasures, an ability to fit into current force packaging concepts, and survivability.(10)

There are two assumptions necessary for this monograph. First, the environment for the use of the OA-10 is Europe since this will be the most severe test of the airborne FAC concept due to the high-threat air defense systems in place. The second assumption is the airborne FAC will be used only in the close or main battle area, and not in deep attack. Currently, there aren't any FAC or CAS aircraft capable of performing deep operations.

These are the criteria which must be satisfied. If the A-10 is to perform in the airborne FAC role successfully, it must be able to operate in a high-threat air defense environment. This means the OA-10 must be survivable, maneuverable, and equipped to communicate with both air and ground elements. The employment option must also use a dedicated FAC force to support the Army requirements of flexibility, survivability, and responsiveness. The employment options will be assessed by an analysis of the merits and disadvantages of each option. The option best satisfying the most criteria will be the best employment option.

## SECTION TWO

### HISTORICAL BACKGROUND

Although the concept of the airborne FAC began prior to World War II, that conflict saw the fruition of an idea begun in 1794, when a French balloonist went aloft to observe Austrian and Dutch troops.(11) In April of 1942, the modern FAC concept was developed with the birth of the Air Support Party (ASP). This was a group of air officers attached to a maneuver unit to direct fighters orbiting overhead.(12) A shortage of available pilots and aircraft weakened Army experience with this concept, though, and when American forces deployed to North Africa, British influence further colored American concepts on the use of the ASP. The ASP became known as "Rover Joe," and this concept was used in Italy between Fifth (US) Army and XII Air Support Command.(13) A "Rover Joe" detachment consisted of experienced fighter-bomber pilots, a Ground Liaison Officer, and

fifteen enlisted personnel.(14) Deployed forward with the advancing units, these ground FAC's proved highly successful.(15)

In the European theater, ground commanders quickly incorporated the idea of "Rover Joe" into their air support plans. Each advancing column in a division was given an ASP, and General Pete Quesada, Commander of IX Tactical Air Command, suggested placing a VHF radio and an ASP officer in each lead tank to enhance air-ground support.(16) This concept, known as Armored Column Cover (ACC), proved extremely valuable in the pursuit of the Germans across France. The ACC concept led General George Patton to proclaim this the best air-ground cooperation he had seen.(17)

Following the success of the ACC, the first airborne FAC was introduced-the "Horsefly." Horsefly observers flew L-5 Sentinels, light, single engine aircraft painted in different colors from attack aircraft. The observers either talked or led fighter-bombers to their targets.(18) In conjunction with the ground FAC's, the Horsefly FAC was the forerunner of today's FAC system.

There were problems, however. The Sentinel aircraft were extremely vulnerable to enemy ground fire, and local air superiority was mandatory prior to using the Horsefly FAC's.(19) These two

problems would recur throughout the airborne FAC's history, limiting their effectiveness. Despite these limitations, the airborne FAC was a success, but with the drawdown of forces following World War II, not one airborne FAC was trained between 1946 and 1950.(20)

Doctrine existed for the airborne FAC, but at the outbreak of the Korean War, only ground FAC's had been trained.(21) Upon arriving in Korea, the ground FAC's quickly found themselves at a disadvantage. Rugged terrain cut down their line of sight, hindering their ability to control air strikes, while the new jet fighters being used for close air support required quick and accurate information.(22) Restricted to the ground, the FAC's couldn't respond as quickly as necessary. To solve these problems, the idea of the airborne FAC was reintroduced and became known as the Mosquito FAC.(23) Flying T-6 Texans, the Mosquito FAC's solved the problems of rapid strike control and an accurate assessment of the battlefield. These FAC's also carried Army observers to gather intelligence.(24)

The old problem of FAC survivability recurred in Korea. Although air superiority was never in question, the ground threat became deadlier, and by the end of the war, the Mosquito FAC's were flying at altitudes of 6,000 feet and higher. This was considered too

high to be effective.(25) Because their aircraft couldn't survive the intense ground fire, though, the FAC's were forced to modify their procedures. Despite this problem, the airborne FAC's were successful, and laid the groundwork for the design of a new FAC aircraft.(26) Unfortunately, the aftermath of the Korean War for the FAC concept was the same as that of World War II. Little, if any, work was done on a new FAC aircraft prior to the Vietnam conflict.

In Vietnam, the ground FAC faced the same problems as in the Korean conflict--an inability to see the battlefield and a lack of mobility. This time the problems were caused by the jungle. To solve these problems, the airborne FAC concept was dusted off and reinstituted. The Air Force had a shortage of properly trained pilots and had to resort to what was termed "A" and "B" FAC's. "A" FAC's were properly trained, experienced pilots who supported Army operations, while "B" FAC's were not as qualified, and controlled only those air strikes not in contact with friendly troops.(27)

The aircraft used by the FAC's also underwent changes. The first aircraft used was the Cessna O-1 Birdog. Similar to the L-5 Sentinel, the O-1 was a light aircraft with no self-protection capability or armor to protect it from ground fire. The transitional

FAC aircraft was the Cessna O-2A Super Skymaster. This aircraft had two engines for increased survivability, but still no self-protection or armor for defense against ground fire. Both of these aircraft had been adapted straight from civilian aircraft in production.(28) In 1968, the first aircraft specifically designed for FAC service was introduced-the North American OV-10 Bronco.(29) It was faster, more survivable, and also carried 7.62mm machine guns for self-protection.(30)

Following Vietnam, the airborne FAC remained a part of both doctrine and training in the Air Force. OV-10 FAC's were part of the CAS plan in Europe until the deployment of ground launched cruise missiles forced the withdrawal of the airborne FAC squadrons.(31) This was due to personnel strength ceilings placed on the Air Force. As a result, although FAC's continue to train for a high-threat role, there are no aircraft currently in the inventory capable of filling this role, and no forces are in place in Europe to provide this support.(32)

There are three constants throughout the history of the airborne FAC. First, airborne FAC's have been required in every major conflict fought by the United States since World War I. Second, airborne FAC's have always been employed in areas where there has

been a limited ground threat and no air threat. The third constant has been the need for a trained force flying aircraft that can effectively accomplish the mission. The airborne FAC concept has never been tested in the high-threat AirLand Battle environment it is likely to face in Europe. The next chapter will describe this threat to see what defenses the OA-10 must survive to be effective in the airborne FAC role.



### SECTION THREE

#### THE HIGH-THREAT ENVIRONMENT

The scenario faced by the airborne FAC in Europe is different from any situation faced before by a USAF FAC. No longer will the airborne FAC have the luxury of complete air superiority and the sole threat of small arms fire. Unlike the historical use of the FAC, this new high-threat environment will require a new approach to the mission of the airborne FAC. There are three threat environments to consider: low, medium, and high-threat.

Low-threat is an environment where the enemy air defenses consist of small arms weapons.(33) There will be no radar directed guns or any missiles. As was the case in World War II, Korea, and Vietnam, there will be no threat from enemy air superiority fighters.

This situation changes in medium and high-threat environments. Both medium and high-threat defenses contain radar

directed guns as well as radar guided missiles.(34) Although medium and high-threat environments tend to overlap, the difference is usually one of degree. In other words, the density of weapons tends to differentiate the distinction between medium and high-threat defenses. Enemy aircraft are also introduced in the high-threat environment. The bottom line of high-threat defenses is that the threat is no longer permissive.

The high-threat environment will be the air defense system faced in Europe. In a Soviet motorized rifle division, there are 11,000 small caliber weapons, sixteen radar directed ZSU 23-4 anti-aircraft guns, and five SA-6/SA-11 missile firing batteries, consisting of four firing units in each battery.(35) The surface-to-air missile regiment may also include SA-8s instead of SA-6 missiles. This combination of forces is formidable when the capabilities of the systems are examined.

The SA-6 and SA-11 are mounted on tracked vehicles, giving them mobility to keep up with the maneuver elements of the division. They are both designated as extremely low altitude weapons, with engagement altitudes as low as 50 meters extending out to 30 kilometers of range.(36) Generally, the SA-6 and SA-11 units will be

behind the forward line of troops, but their range puts the FAC and CAS aircraft within their engagement envelopes.

The SA-8 is a short range weapon, mounted on a wheeled vehicle. Unlike the SA-6 or SA-11, the SA-8 carries its own radar. Capable of killing aircraft as low as 10 meters in altitude out to 12 kilometers in range, the SA-8 has the capability to launch two missiles at one target.(37) The missiles, as well as the hand-held SA-7s, SA-14s, and SA-16s, complement the gun systems such as the ZSU 23-4 and the new ZSU-X.(38)

The Soviet aircraft threat is also significant. New aircraft, such as the MiG-29 Fulcrum, the MiG-31 Foxhound, and the Su-27 Flanker, have entered service. These jets give the Soviets a low altitude interception capability previously exclusive to the West.(39) This added capability is a direct threat to the low flying FAC and CAS aircraft. A frontal aviation division consists of three fighter regiments of three fighter squadrons each. This totals 108-144 aircraft per division.(40) Normally, a front employs two divisions in the air-to-air role.(41)

By combining these systems, the Soviets have established an air defense system that stretches across the depth of the

battlefield.(42) Although the defenses appear impenetrable, suppression, fog, and friction will combine to create windows of opportunity in the high-threat defenses. However, these defenses can't be ignored; our FAC aircraft must be survivable if CAS is going to be effective.

Currently, FAC aircraft can't survive. Experience at the Ft. Irwin National Training Center has shown that FAC aircraft marking targets in a high-threat environment are destroyed at the rate of two aircraft for every enemy tank destroyed.(43) This is because our current FAC inventory of 60 OV-10s, 73 OA-37s, and 29 OT-37s were not designed for a high-threat environment.(44) These aircraft are all tailored for low-threat defense systems. Although the Air Force says its FAC force is tailored for both low and high-threat conflicts, the Ft. Irwin experience suggests that this is not true.

To solve this problem, the Air Force has relied on the ground FAC. The Air Force has attempted to solve the inherent problems of the ground FAC by placing him in an Army helicopter. While this makes the ground FAC a temporary airborne FAC, there are a limited number of helicopters, and the Army has not yet dedicated helicopters to this role.(45)

Thus, for CAS to be a necessary part of AirLand Battle, there must be a survivable airborne FAC aircraft. Since the FAC role is integral to CAS and of "integral importance to the AirLand Battle concept,"(46) the conversion of A-10 aircraft to OA-10's makes sense only if the OA-10 can survive the high-threat defense environment.

## **SECTION FOUR**

### **A-10 CAPABILITIES**

The ability of the A-10 to survive and perform in the FAC role is critical to the research question. As seen from the doctrine and missions of the FAC role, a FAC aircraft must be able to survive, maneuver, mark targets, and communicate with ground and air forces. The A-10 is capable of performing all these tasks.

The A-10 was originally designed for the CAS mission, and the design drew from both American experiences in Vietnam and Israeli lessons from the 1973 Yom Kippur war. These conflicts showed the main cause of aircraft losses to be from anti-aircraft fire, both gun and missile. Of the losses due to anti-aircraft fire, 62 per cent were caused by hits in the fuel system, 18 per cent were lost due to pilot incapacitation, 7 per cent from engine loss, and 3 per cent by structural failure.(47)

With these losses in mind, the A-10 fuel system was designed to be carried in the central area of the aircraft.(48) The fuel tanks have self-sealing bags and are filled with reticulated foam to inhibit the spread of fire.(49) Protective firewalls seal the airframe from the fuel lines, and the majority of the fuel lines run across the top of the aircraft for added protection from ground fire.(50) This makes the A-10 less likely to be lost due to fuel fires.

The pilot is protected by a titanium "bathtub." This armor plating can withstand a direct hit by a 23mm shell, and the shrapnel from the explosion is contained by a nylon webbing in the interior of the "bathtub."(51) No other aircraft in the NATO inventory has this protection for its pilot.

The engines are externally mounted high on the rear fuselage. This position stops structural breakup from occurring if one engine explodes, since the blast is not directed internally or towards the other engine. The aircraft can fly on the thrust from one engine, and a backup hydraulics system powers the flight controls in the event of loss of the primary system.(52) See figures 1 and 2 for a detailed layout of these systems.

Structurally, the aircraft can lose half of one wing, one rudder,

and one engine and still make a controlled recovery.(53) Even if the aircraft can't fly again, it can still be used for spare parts.

The A-10's maneuverability translates into lower exposure time. The A-10 can generate a turn radius of 2,500 feet at 300 knots (combat speed), which forces the ZSU 23-4 projectile to miss by up to 1,300 feet.(54) The A-10 can use its maneuverability to mask its approach into the target area, enhancing survivability. In fact, the A-10 can turn better than a comparably loaded F-16. At 320 knots and 3 1/2 G's, the A-10 generates a 2,700 foot turn radius in 16 seconds, while an F-16 takes 17 seconds to turn 3,620 feet at a higher airspeed and G loading.(55)

The aircraft can carry up to 16,000 pounds of ordnance. Internally, the A-10 carries the 30mm GAU-8A Avenger cannon. This cannon is capable of either marking or destroying targets. It also gives the A-10 pilot an excellent self-protection capability.(56) The A-10 can carry up to ten pods of white phosphorous (WP) rockets, the standard FAC marking munition.

Agility and maneuverability combine with survivability to allow the A-10 pilot to search out targets. With his onboard inertial navigation system, the pilot can record target locations for either



ground or air elements.(57) Using any one of three radios (UHF, VHF, or FM), the pilot can communicate with either Army or Air Force units.(58)

The A-10 is uniquely suited to transition to the OA-10 mission. Although originally designed as a CAS aircraft, the aircraft meets all the requirements necessary to be a successful airborne FAC aircraft. The A-10 is survivable, having many design features built into it to enable it to survive the high-threat CAS mission. The aircraft is also maneuverable, allowing it to stay clear of enemy defenses, or use terrain to mask its approach to the target and avoid detection. Finally, the communications systems and ordnance capability allow it to talk to both Air Force CAS aircraft and Army ground units, and to mark targets effectively. The OA-10 will be the first FAC aircraft capable of working in the high-threat environment. The only question left to be answered is how best to employ it in the AirLand Battle?

FIGURE ONE: AIRCRAFT LAYOUT

## Mission and Description

Navy Equivalent: None

Mfg's Model: A-10

The principal mission of the A-10A is the close support of ground fighting units in support of the attainment of U.S. military objectives over a wide range of possible conflict situations. It is also designed to function in the escort and armed reconnaissance roles.

The A-10A is a single-place, highly maneuverable vehicle powered by two turbofan engines and is capable of operating from semi-prepared forward airstrips.

Special features of this airplane are split aileron speed brakes, cockpit protective armor, twin vertical tail, high-lift airfoil, universal air refueling receptacle slipway installation, engine location in aft fuselage mounted pods and full triple redundant flight control system.

The fire control system includes a 30mm high velocity gun. Armament controls and displays utilized for identification, selection, arming, firing, monitoring, and selective jettisoning of stores are consolidated into a single control panel. The aircraft serves as a stable aiming platform and has the capability to carry an external store load of up to 16,000 lb. of ordnance on 10 fixed pylons plus an optional centerline station.

The cockpit is provided with 2.75 psi differential pressurization, heating and cooling, jettisonable canopy, zero speed/zero altitude escape seat and anti-G suit provision.

## Development

Design Initiated .....	Jul 70
First Flight (Prototype) .....	May 72
Contract Approved .....	Mar 73
First Flight (DT & E) .....	Dec 74

## POWER PLANT

No. & Model .....	(2) TF34 GE-100
Mfr .....	General Electric
Engine Spec No. ....	CP45E0002
Type .....	Axial Flow Turbofan
Length .....	78 0"
Diameter .....	44 0"
Weight (dry) .....	1427 lb
Tail Pipe .....	Fixed Area Nozzle
Augmentation .....	None

## FUEL

Location	No. Tanks	Gal
Wing, int	2	646
Wing, drop	2	1200
Fus. int*	2	992
Fus. drop	1	606
		<b>Total 3438</b>

\* Partial self-sealing

Grade .....	JP-4
Specification .....	MIL-T-5624

OIL	
Nozzle .....	2 (Total 2.8)
Specification .....	MIL-L-7808

## WEIGHTS

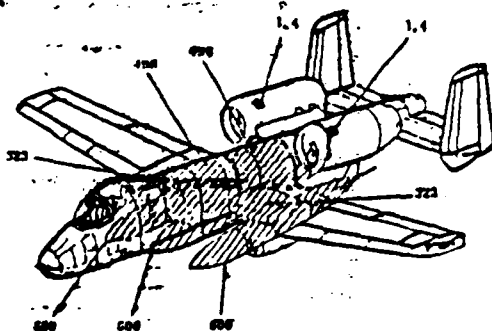
Loading	Lb	L.F
Empty	19,856 (E)	
Basic	22,844 (E)	
Design	29,701	7.33
Combat	38,138	5.85
Max T.O. (overload)	46,786	4.88
Max T.O. (normal)	46,270	4.03
Max Land	46,270	4.00

(E) Estimated

\* For Basic Mission

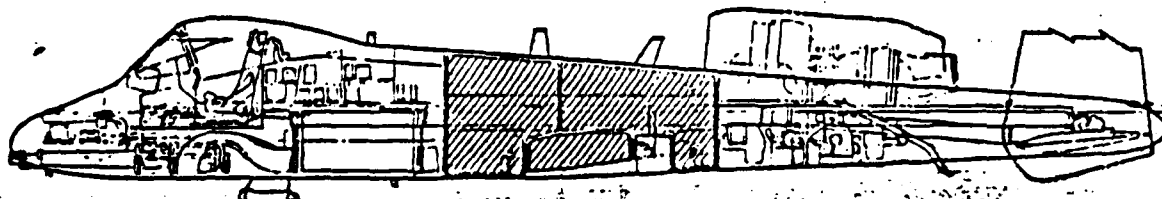
† Defined by Air Vehicle Specification

‡ Limited by space



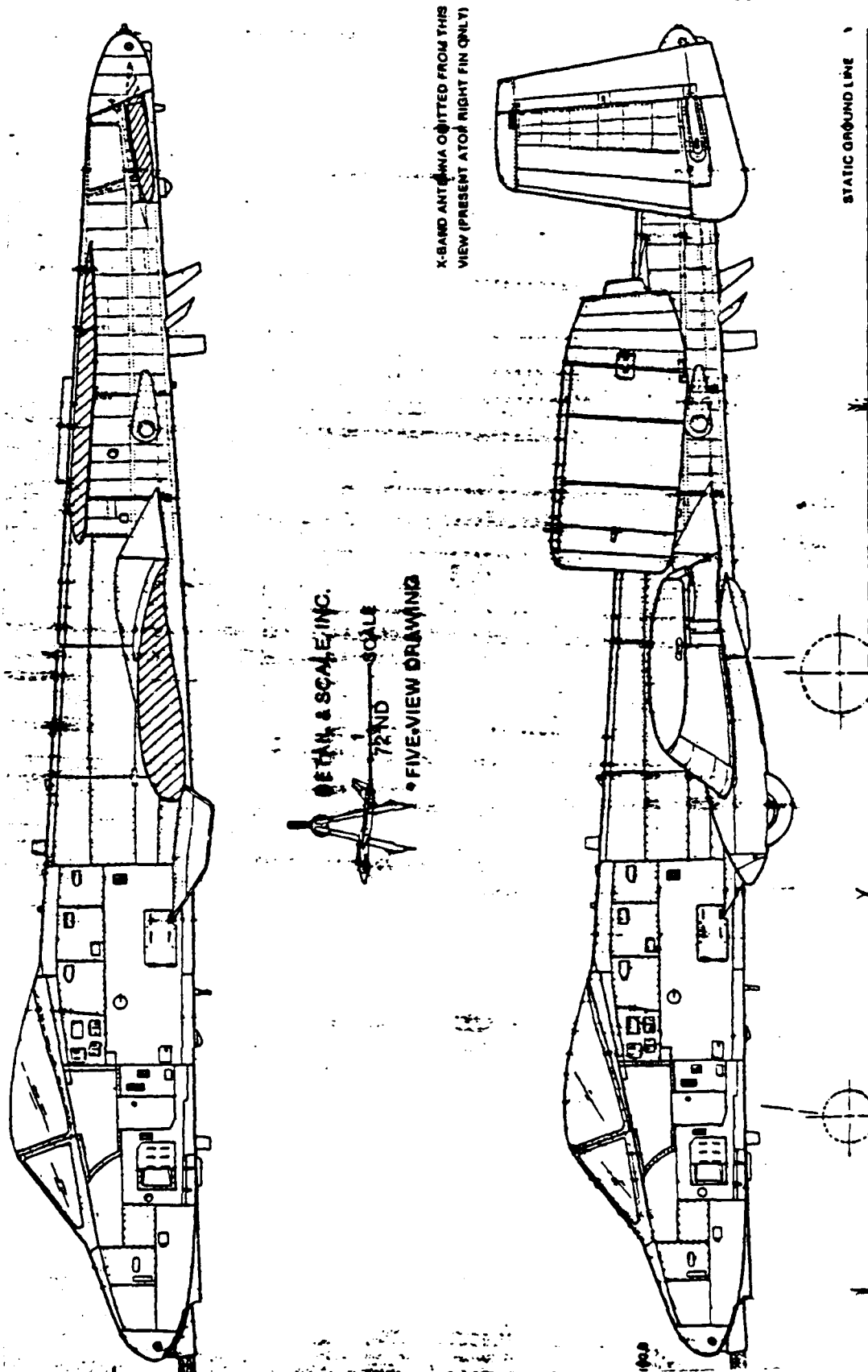
Fuel (Gal)

Oil (Gal)



Source: Dana Bell's A-10 Warthog, p. 11.

FIGURE TWO: AIRCRAFT LAYOUT AND DESIGN



Source: Dana Bell's A-10 Warthog, P. 12.

## **SECTION FIVE**

### **ANALYSIS OF THE OA-10 EMPLOYMENT OPTIONS**

There are two employment options currently under consideration. Tactical Air Command (TAC) sees the OA-10 as just another FAC aircraft to be used in the traditional method, while United States Air Forces in Europe (USAFE) sees the FAC mission as an adjunct to their current CAS mission.(59) While these two options are valid, there is a third option that needs to be explored. This is an expansion of the current FAC mission to take advantage of the increased capabilities afforded by the OA-10. To complete the analysis of these options, though, they must be applied against the Army requirements for CAS. The employment option which best supports the Army requirements of flexibility, availability, and survivability should govern the employment of the OA-10 in the AirLand Battle.

The TAC option sees the OA-10 as a standard FAC aircraft. This concept uses the OA-10 as a single aircraft equipped with rockets for target marking and using the 30mm cannon only for self-protection.(60) This concept merely upgrades the FAC airplane fleet without adding to the capabilities of the FAC. To make the FAC workload easier, TAC is looking at upgrades such as an automatic target handoff system, a communications package, and a cockpit management system.(61) These modifications are in keeping with TAC Manual 2-1, which visualizes the airborne FAC as a radio relay platform for the ground FAC.(62)

Under TAC's concept, here's how a typical FAC mission would run using the OA-10 as a traditional FAC aircraft (see Figure 3). With the CAS aircraft holding at a contact point, the airborne FAC relays the briefing given to him by the ground FAC. The ground FAC can't brief the fighters directly because he is out of line of sight contact with them. The relayed briefing includes the heading to the target from the initial point, distance to the target, target type and location, target elevation, enemy air defenses, friendly troop information, and egress instructions. Following this briefing, the fighters depart for the initial point and make contact with the ground

FAC, who will give them final clearance authority to release ordnance. Without the ground FAC, the airborne FAC must mark the target and give the final clearance.(63)

The USAFE concept of OA-10 employment is more flexible. USAFE wants to retain the CAS mission and fly the FAC mission as well.(64) This would mean armed reconnaissance by the OA-10's, which would seem to be a return to the days of World War II and the Armored Column Cover. Besides not having the same number of aircraft now and facing a significantly higher air threat, this concept also calls for an increased workload for the pilot. As stated in Section Two, the demands of the FAC mission have always required a dedicated FAC force and aircraft. As will be seen later, this option takes away from both the FAC and CAS mission.

The third employment option not addressed by either TAC or USAFE is one that expands the role of the airborne FAC. Instead of making the FAC a radio relay platform, this option uses the combat capabilities of the OA-10 to add to the CAS effort while performing FAC duties. This third option that I call the Close Air Support Team, or CAST, puts a pair of OA-10s in the target area. Two aircraft add to survivability and also add an extra set of eyes to search for targets.

The aircraft are loaded with the standard CAS ordnance of AGM-65 Maverick missiles for stand-off capability and a full load of 30mm ammunition. The Mavericks can be used to fire at targets while keeping the OA-10s outside of the threat envelope, thus enhancing survivability. Using ground FAC's, if available, the OA-10s locate targets and call for the CAS fighters. While the CAS aircraft are enroute, the OA-10s attempt to locate air defense systems, using their maneuverability and survivability to avoid being shot down. Coordinating with Army helicopters and artillery, the OA-10s can form an effective suppression effort prior to and during the attack of the CAS fighters. If the enemy air defense is not a threat, the OA-10s can also attack targets in coordination with the CAS aircraft, much the same way A-10s and Army helicopters currently run Joint Air Attack Team (JAAT) tactics.(65)

These are the three employment options. Now, they must be tested against the Army requirements for CAS to see if these options will support the CAS program. To validate these options, then, they must be flexible, available, and survivable.

First, it is necessary to define these requirements. Flexibility means the ability to support Army operations at the Forward Line of

Troops (FLOT), cross FLOT, and during deep operations.(66)

Availability means responsiveness to Army requests-day, night, and during adverse weather.(67) Survivability is operating in a high-threat air defense environment.(68)

Although the Air Force agrees with these requirements, there are some problems . Currently, Air Force doctrine is evolving to cover the cross FLOT operations and the close support of deep attack, but the means to support such operations with an airborne FAC is non-existent. Ground FAC's are the only solution at this time.

All-weather and night CAS in high-threat environments is also non-existent. Until the Low Altitude Navigation and Targeting Infrared System for Night (LANTIRN) becomes available in 1990, not even the new CAS fighter will have this capability.(69)

Within these restrictions, then, and with our assumption that the airborne FAC is used only in the close battle, how do the three employment options compare?

Option 1, the standard TAC employment of airborne FAC's, adds little flexibility to the existing CAS structure. This option merely upgrades the type of aircraft FAC's will fly. It does, however, finally give the Air Force a true high-threat FAC aircraft. The problem with



Option 1 is its use of the FAC as a radio relay platform and a target marker. By keeping its doctrine rooted in the past, the Air Force will not add to the flexibility of CAS, and the OA-10 will be wasted in this role.

Availability has been enhanced in Option 1. The OA-10 has a longer loiter time than any of the current FAC aircraft, and thus would be on station longer, improving the availability of the FAC services. This option also retains the dedicated FAC force necessary to accomplish all the FAC missions. Adverse weather capability is also improved, although the CAS aircraft being controlled must also have the same weather capability as the OA-10 for this to have an appreciable effect.

Finally, survivability is enhanced because of the design of the OA-10. The current FAC inventory, with the exception of the OV-10, are trainer or light aircraft, with no self-protection capability or design survivability features. As detailed in Section Four, the OA-10 can survive in this environment.

Option 2, USAFE's concept of combined CAS/FAC operations, detracts from the flexibility of the current CAS concept by making the OA-10 a dual-role aircraft. Although this seems expedient,

making one aircraft perform the role of two brings about a conflict of priorities. Obviously, the CAS mission will have priority, but then who will supply the FAC aircraft to support the CAS sorties? If the CAS aircraft are forced to supply these aircraft, then a corresponding decrease in aircraft available for CAS occurs. This detracts from the Air Force's ability to support the Army by deleting the dedicated FAC force.

Responsiveness to Army requests is also affected. If the airborne FAC forces are used in the role of marking targets, these OA-10's can't easily transition to a CAS role. They must return to their Forward Operating Location (FOL) to upload new ordnance. Currently, the A-10 FOL's are positioned between 20 and 30 minutes of flying time from the target areas.(70) Add to this flying time a turn around time on the ground, and anywhere from one to two hours will be necessary to get the aircraft back on station. Immediate CAS requests will be directly affected by this problem.

Survivability is also affected. If the aircraft are flying both missions, it means increased flying time and exposure time to enemy defenses. Increased flying time causes more maintenance down time, resulting in fewer aircraft available to fly, while increased exposure

time means a greater chance of losing aircraft. Both of these result in fewer aircraft to support the Army.

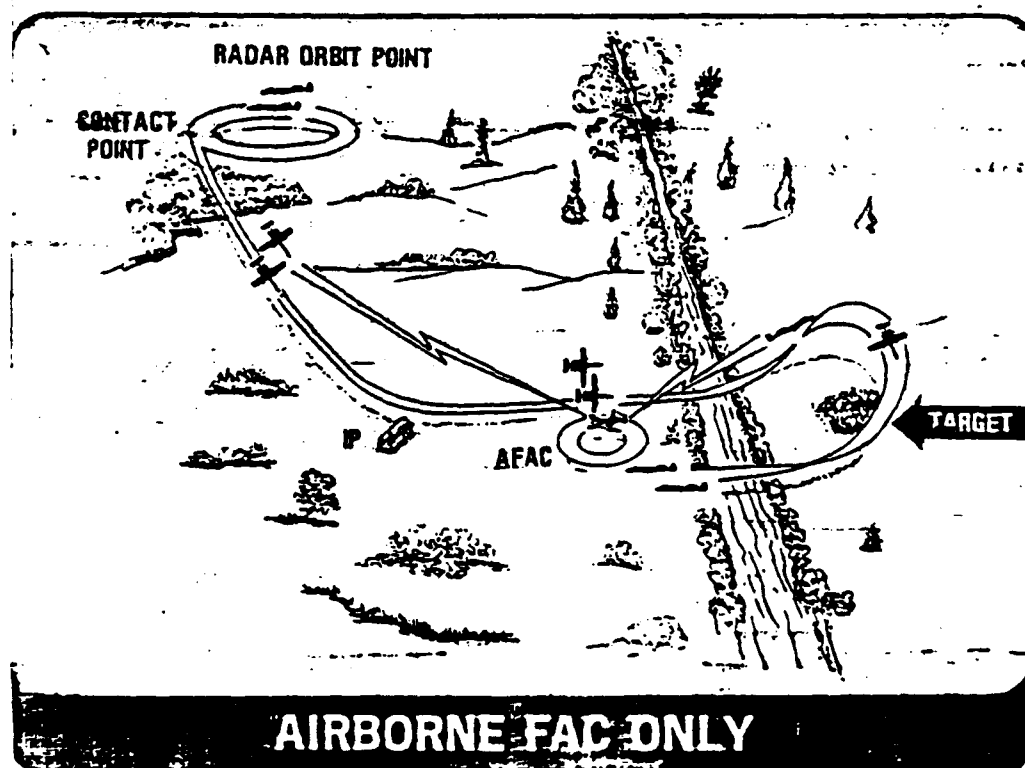
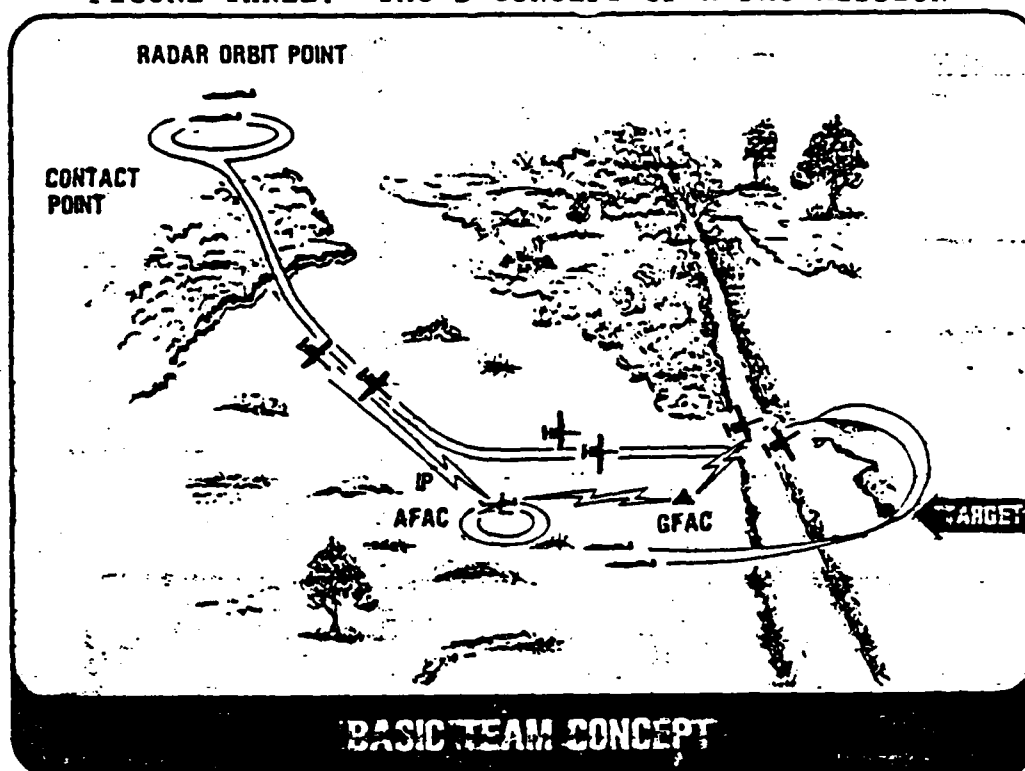
The third option, using the OA-10 as a member of the CAST, enhances the flexibility of the CAS system by expanding the role of the airborne FAC. It allows the airborne FAC not only to perform FAC missions, but also to use his ordnance to attack targets in conjunction with the CAS aircraft. This equates to a true economy of force for the Air Force, and puts more ordnance on target for the Army. In this option, the OA-10 can suppress, destroy, or mark targets, giving the Air Force the flexibility to mass more fires in the CAS attack simply by changing the current role of the FAC.

This option also improves the availability of aircraft to Army requests. Rather than take aircraft away from CAS, the CAST option allows the OA-10 to function as a CAS aircraft as the need arises, but retains the dedicated FAC force to provide the other support required. This adds to Air Force responsiveness to Army immediate CAS requests. The OA-10 can deliver effective firepower against targets when they are first located, slowing down the movement of the targets until the arrival of the CAS aircraft. Targets that may have disappeared before the CAS aircraft arrive can now be hit.

Finally, survivability is improved, not only for the FAC force, but for the CAS force as well. Using the OA-10 and CAS fighters in the CAST option will allow more destruction of enemy targets while protecting our own forces better. By adding Army helicopters and artillery into this system, a formidable package can be applied against enemy formations.

By comparing these three options against the Army requirements, then, it appears that Option 3, the CAST system, is the best way to employ the OA-10 in the AirLand Battle. That system enhances flexibility, availability, and survivability, while at the same time increasing the Air Force's FAC capabilities. It is a true economy of force for the Air Force, for it doesn't waste an asset that would otherwise disappear from the battlefield in the traditional FAC role. Option 3 also provides for a dedicated FAC force with no conflict of priorities. See Figure 4 for a matrix comparison of the criteria against the three employment options.

FIGURE THREE: TAC'S CONCEPT OF A FAC MISSION



Source: TAC Manual 2-1, p. 4-44.

**FIGURE FOUR**  
**MATRIX OF CRITERIA AND OPTIONS**

<b>CRITERIA</b>	<b>OPTION 1</b>	<b>OPTION 2</b>	<b>OPTION 3</b>
<b>DEDICATED FAC FORCE</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>
<b>SURVIVABLE IN HIGH-THREAT</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>
<b>MANEUVERABLE</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>
<b>COMMUNICATIONS</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>
<b>MARK TARGETS</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>
<b>FLEXIBILITY</b>	<b>NO</b>	<b>NO</b>	<b>YES</b>
<b>RESPONSIVENESS</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>
<b>ECONOMY OF FORCE</b>	<b>NO</b>	<b>NO</b>	<b>YES</b>

## SECTION SIX

### CONCLUSION

During the last three major conflicts, the USAF has relied on airborne FAC's to support the CAS mission. This will remain true for AirLand Battle. The FAC mission requires an aircraft that is survivable in a high-threat defense environment. That aircraft must also be capable of performing the airborne FAC role. Finally, it requires an employment option that supports the Army CAS requirements of flexibility, responsiveness, and survivability. The OA-10 and the CAST system can do this job.

Although originally designed as a CAS aircraft, the OA-10 can do the airborne FAC role. The OA-10 is survivable, maneuverable, and is also equipped with the necessary communications equipment to coordinate air strikes. The OA-10 provides the Air Force with its first FAC aircraft capable of surviving the spectrum of air defense

environments. For the first time in the history of the airborne FAC, the FAC will be able to accomplish all his missions.

The three employment options presented all answer the requirements, but only one meets all the criteria. That is Option 3, the CAST system. This option provides a dedicated FAC force flying an aircraft that is survivable, maneuverable, and capable of coordination between the Army and the Air Force. Option 3 also supports the Army CAS requirements. This option increases the flexibility of the current CAS structure, improves the availability of aircraft capable of delivering firepower on the battlefield, and also enhances the survivability of both CAS and FAC aircraft. Option 3 allows for economy of force. By expanding the role of the airborne FAC to help destroy targets, every aircraft capable of destroying the enemy is put to use on the battlefield. By meeting all the criteria, this option is the best method for employing the OA-10 in the AirLand Battle.

Thus, the Air Force should transition the A-10 to the OA-10 role. Then, the doctrine concerning the employment of the OA-10 should be expanded to take advantage of the unique capabilities of the



OA-10. By doing this, the Air Force will best support the Army in the close operations of the AirLand Battle.

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